

**ASSESSMENT OF THE INSTRUCTIONAL
COMPETENCIES OF TEACHERS FOR THE
IMPLEMENTATION OF SECONDARY SCHOOL
CHEMISTRY CURRICULUM IN NNEWI SOUTH
LOCAL GOVERNMENT AREA**

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Abstract

The study was conducted to assess the instructional competencies of teachers for the implementation of secondary school chemistry curriculum in Nnewi South Local Government Area. The study was guided by three research questions and descriptive survey research design was adopted in the study. The population of the study was 35 which include 15 principals and 20 chemistry teachers. There was no sampling as the entire population was used since it was manageable by the researcher. The data collection was carried out using 31 item structured questionnaire developed by the researcher titled: Assessment of the Instructional Competencies of Teachers for the Implementation of chemistry Curriculum Questionnaire (AICTICCQ). The instrument was validated by two lecturers from the Department of Science Education, Michael Okpara University of Agriculture, Umudike. The lecturers corrections and suggestions were used to produce the final copy of instrument. The instrument was tested for reliability using 20 copies on principals and teachers in Nnewi North which is not part of the population under study. The reliability coefficient of 0.76 was obtained using Cronbach Alpha method. Two research assistants were used in the administration of the questionnaire

through direct delivery and retrieval method and the entire 35 copies administered were retrieved completely filled and used for data analyses, mean and standard deviation were used to answer the three research questions. Hence, the result of the data analyses indicated that all the 31 identified were the competencies possessed by teachers in instructional planning, knowledge of subject matter and classroom management. It was suggested that since effective implementation of secondary school chemistry curriculum depends partly on teachers competencies there is need to strengthen the competencies of chemistry teachers in secondary school through in-service teachers training, seminar and conferences.

Introduction

Education is universally recognized as an instrument for social, political, scientific and technological development. This is the reason why no society can afford to toy with the education of its citizens as this could result in a snail speed development. Education is also seen as an aggregate of all the processes by which a child or young adult develop his/her abilities, attitudes and other forms of behaviours which are of value to the society in which he/she lives. Education occurs through any experience that has a general influence on the way one thinks, feels or acts (Oriakhi, & Ameh, 2014). Education is the bedrock and key to national development. In pursuant of this goal of education and the above mentioned benefits of education, curriculum is developed in different subject areas in every school in the various educational levels including secondary education (Abdul-Kareem, 2011). Specifically, secondary education is the form of education which learners receive after primary education and before the tertiary stage (Federal Republic of Nigeria, 2014). It is the bridge between the primary and tertiary education. In Nigeria, secondary education is structured for six years, which is 3 years of upper basic (junior secondary) and another 3 years of senior secondary class (FRN, 2014). The importance of secondary education made the Federal Government of Nigeria in her National Policy on Education to state the broad aims of secondary education as preparation of individual for useful living within the society and for higher education (FRN, 2014). The underlining principle here is that the secondary schools should be able to provide quality secondary education to all who can benefit from it, from the curriculum provided.

Curriculum is described as a well-defined and prescribed programme of studies, which the learners must fulfil in order to pass a certain academic level of education. Curriculum is being conceptualized as learning activities that make up a particular subject matter in school (Ali & Ajibola, 2015). Curriculum according to Ogunyemi in Offor (2013) is seen as the planned and unplanned experiences, which learners receive in the process of their formal or semiformal education for the purpose of becoming literate who can make meaningful contribution to the success of their society and the world at large.

However, if the planned curriculum is not implemented, all efforts put together in the planning of the curriculum are in vain. Curriculum implementation may be described as the actual use of the planned curriculum or document in the classroom. This implies putting the document of the curriculum into practices (Onyemerekeya, 2013). In the view of Ekpo and Osam (2019) curriculum implementation are structured in various steps in achieving the desirable planned curriculum objectives of the programme of education. In order to actualize these objectives, emphasis must be laid on the quality of educational programmes undertaken as well as the quality and competencies of the teachers who implement the curriculum of the different subject areas. This is because quality teachers assured qualitative education, which in turn leads to rapid development of a nation (Okolo, 2013). Teachers are the major factors of the curriculum implementation at the classroom level including the junior secondary school Agriculture curriculum. Recognizing the role of teachers as the implementers of any educational policy document, Ukeje in Ebiringa (2012) maintained that “education may unlock the door to modernization but it is the teacher who holds the keys” as stated in the national policy in education that no nation can rise above the quality of its teachers (Federal Government of Nigeria, FGN, 2014). It is the teacher who determines what happens in the classroom, Chemistry classroom inclusive. Successful implementation of any educational programme can only be assured through teachers who have acquired the needed competencies in terms of knowledge, skills, values and attitudes in different subject chemistry inclusive.

Chemistry is one of the core science subjects for science students. It is the pivot on which the wheel of science rotates (Nwani, 2018). Chemistry is very important and helpful in fields such as medicine,

agriculture, transportation, housing, industries, etc. Life is made more meaningful with chemical product such as drugs, cosmetics, paints, soap, fertilizers etc. Chemistry as an academic discipline plays a very significant role in unifying other science subjects. Chemistry therefore is seen as the central science and the mother of all sciences. It is a branch of pure science that deals with composition, transformation, properties and uses of matter (Agogo & Maduawesi, 2014). The objectives of secondary school chemistry education curriculum are expected among other things enable students to: Develop interest in the subject of chemistry; acquire basic theoretical and practical knowledge and skills and so on. The teacher is the one who sees to the realization of the above objectives in the classroom. This means that if the teacher is not effective and does not possess the necessary competencies, then there is bound to be problems in the line of educational achievement and it is also on this note the researcher aims at assessing the instructional competencies of teachers for the implementation of chemistry curriculum.

Assessment in the view of Okoro in Lawal, (2013), is the process of judging the state or effectiveness of a programme or instruction through a collected data. In the view of Harcourt in Baba (2015), assessment has enormous potentials for helping individual teachers to make positive changes in the lives of the students, programmes and organizations. Harcourt also noted that a careful, fair and diplomatic assessment study will provide programme planners and providers with information that is critical to succeed in meeting their short-term objectives and long-term educational goals through enhancing competency of teachers for effective instructional delivery and students quality learning. Competency in view of Shishi, Muhammed and Wever (2016), is a successful performance of a task through the use of knowledge, skill, attitude and judgment. It can be described as the state of being fully equipped for the performance of particular task. These competencies in view of Okoro in Lawal, (2013), could be cognitive, affective, psychomotor competencies for effective instructional delivery in chemistry. In the opinion of Shishi, Muhammed and Wever (2016), Anjov, Muhammed and Umoru (2016), the instructional competencies of teachers maybe referred to as teachers adequate knowledge of instructional planning/organization, subject matter, classroom management, use of instructional methodologies/strategies, use of instructional materials among others.

This implies that since no education system can rise above the quality of its teachers, instructional competencies of teachers in planning/organizing, adequate knowledge of subject matter, classroom management use of instructional materials, use of instructional methods/strategies among others are very paramount in implementation of chemistry curriculum. Specifically, planning is seen as the designing of the teacher's road map of what students need to learn and how it will be done effectively during the class time (Milkova, 2017). The author pointed out that a successful lesson plan addresses and integrates three key components of objectives for student learning, teaching/learning activities, strategies to check students understanding. Under the planning stage, the teacher has to answer the fundamental questions of whom, why, what, when, and how (Adebayo, 2019).

However, teachers knowledge of subject matter is the is pertinent in implementation of Agriculture curriculum. Teachers knowledge of subject matter referred to as the sufficient, up-to-date knowledge of the subject area (Ebiringa, 2012). Though, teacher knowledge of subject matter is not enough for good teaching, it must be accompanied by the essential elements of classroom management (Okafor, 2016). Classroom management involves the application of behavioural principles and policies of discipline that are effective and create an ideal learning environment that facilitated student interest toward learning. Thus, effective classroom management through teachers communications facilitate active engagement of students in learning activities (Igbokwe & Eze, 2019). Teacher quality classroom management involves the application of competencies through behavioural principles and policies of discipline that are effective and create an ideal learning environment. The behavioural principles include: reinforcement of every kind, modeling, extinction, satiation, role shifts, utilization of logical consequences which help in promoting students' academic performance (Mezieobi, 2019). Consequently poor classroom management couple with incompetencies of some teachers in teaching of chemistry may result to poor implementation of chemistry curriculum and the actualization of the objectives of the subject. It is therefore on this background that the researcher intends to assess the instructional competencies of teachers for the implementation of secondary schools chemistry curriculum in Nnewi South Local Government Area.

The chemistry curriculum needs to be effectively implemented to achieve the above mentioned objectives, curb the numerous pit-falls in chemistry education and prepare students for tertiary education. For instance, because of poor background formation of secondary students in chemistry, many African students are unemployed and cannot employ themselves because they lack the pre requisite skills for job creation even after passing through a well-articulated curriculum that has been revised by experts and equipped to meet the challenging needs of our society. This again revealed the existing gap in the level of curriculum implementation and confirmed the need to ascertain the level of instructional competencies of teachers for the implementation of secondary school chemistry curriculum. Effective implementation of chemistry curriculum require teachers with adequate competencies in subject matter, instructional planning, classroom management, use of instructional materials as well as use of instructional methodology among others.

Implementation of chemistry curriculum at the secondary schools in Nnewi South Local Government Area seems to be constraints by wrong placement of Teachers. Hence, this situation is big problem to the actualization of the objectives of chemistry in a bid to prepare the young ones as contained in the National Policy on Education and also in pursuance of food security agenda of the federal government of Nigeria. This situation is worrisome since no nation can rise above the quality of its teachers. It is therefore on this backdrop the researcher sought to assess the instructional competencies of teachers for the implementation of secondary school chemistry curriculum in Nnewi South Local Government Area.

Purpose of the Study

The study sought to assess the competencies possessed by teachers in instructional planning for the implementation of junior secondary school chemistry curriculum in Nnewi South Local Government Area.

The following research questions were posed to guide the study:

1. What are the competencies possessed by teachers in instructional planning for the implementation of secondary school chemistry curriculum in Nnewi South Local Government Area?

2. What are the competencies possessed by teachers in knowledge of subject matter for the implementation of junior secondary school chemistry curriculum in Nnewi South Local Government Area?
3. What are the competencies possessed by teachers in classroom management for the implementation of junior secondary school chemistry curriculum in Nnewi South Local Government Area?

Methods

Descriptive survey research design was adopted in the study. The design was chosen because it permitted investigation, description and recording of information in their natural setting. The study was conducted in Nnewi South Local Government Area. The population of the study is 35 which include 15 principals and 20 chemistry teachers. There was no sampling the entire population was used since it was manageable by the researcher. The data collection was carried out using 31 item structured questionnaire developed by the researcher titled: Assessment of the Instructional Competencies of Teachers for the Implementation of chemistry Curriculum Questionnaire (AICTICCQ). The instrument was designed using four point rating scales of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) with numerical values of 4, 3, 2, and 1 respectively. The instrument was validated by two lecturers from the Department of Science Education (Chemistry Education). The lecturers corrections and suggestions was used to produce the final copy of instrument. The instrument was tested for reliability using 20 copies on principals and teachers in Nnewi North which is not part of the population under study. The reliability coefficient of 0.76 was obtained using Cronbach Alpha method. Two research assistants were used in the administration of the questionnaire through direct delivery and retrieval method and the entire 35 copies administered were retrieved completely filled and used for data analyses, mean and standard deviation were used to answer the three research questions. Hence, the mean score of 2.50 and above was considered as agreed while the mean score below 2.50 considered as disagreed.

Results

The result of data analysed from research questions answered are presented in tables below.

Research Question 1: What are the competencies possessed by teachers in instructional planning for the implementation of secondary school chemistry curriculum in Nnewi South Local Government Area?

Table 1: Mean and standard deviation of the respondents' responses on the competencies possessed by teachers in instructional planning for the implementation of secondary school chemistry curriculum in Nnewi South Local Government Area

S/N	ITEM	X	S.D	Remarks
1.	Ability to identify the topic to be taught in chemistry	3.74	0.61	Agreed
2.	Ability to design instructional contents objectives on specific topics in chemistry	3.57	0.88	Agreed
3.	Capacity to prepare lesson plan clearly	3.68	0.71	Agreed
4.	Develop lesson note inline with lesson plan	3.62	0.87	Agreed
5.	Adequate skills to structure the subject content properly	3.74	0.85	Agreed
6.	Select the method/strategies of instruction	3.60	0.88	Agreed
7.	Select materials for quality teaching and learning of chemistry	3.51	1.06	Agreed
8.	Ability to organize instructional contents within time frame	3.65	0.76	Agreed
9.	Adopt different instructional evaluation strategies to be used	3.62	0.89	Agreed
10.	Develop questions for the learners as instructional closure	3.71	0.85	Agreed

KEY: X = mean, S.D = Standard deviation, Rmks.= Remarks.

The data in Table 1 above revealed that all the 10 items had their mean value ranging from 3.51 to 3.74 and standard deviation value ranging from 0.61 to 1.06. The items were agreed because they were all above the mean score of 2.50 earlier set as acceptance bench mark for this study. This indicated that the items were the competencies possessed by

teachers in instructional planning for the implementation of secondary school chemistry curriculum in Nnewi South Local Government Area.

Research Question 2: What are the competencies possessed by teachers in knowledge of subject matter for the implementation of secondary school chemistry curriculum in Nnewi South Local Government Area?

Table 2: Mean and standard deviation of the respondents' responses on the competencies possessed by teachers in knowledge of subject matter for the implementation of junior secondary school Agriculture curriculum in Nnewi South Local Government Area

S/N	ITEM	X	S.D	Remarks
1.	Adequate knowledge of basic concepts of chemistry	3.68	0.63	Agreed
2.	Adequate knowledge of chemical reactions	3.7	70.42	Agreed
3.	Adequate knowledge of redox reaction	3.8	50.35	Agreed
4.	Adequate knowledge of carbon elements	3.40	1.16	Agreed
5.	Adequate knowledge of organic chemistry	3.57	1.00	Agreed
6.	Adequate knowledge of inorganic chemistry	3.65	0.68	Agreed
7.	Adequate knowledge of compounds and mixture	3.68	0.71	Agreed
8.	Adequate knowledge of energy	3.54	1.06	Agreed
9.	Adequate knowledge of radiation	3.51	0.95	Agreed
10.	Adequate knowledge of practical chemistry	3.68	0.75	Agreed
11.	Adequate knowledge of pasture/forage crops	3.73	0.82	Agreed

The data in Table 2, present the responses of the respondents on the competencies possessed by teachers in knowledge of subject matter for the secondary school chemistry curriculum in Nnewi South Local Government Area. The data revealed that the mean responses of the

respondents in all the 11 items ranged from 3.51 and 3.85 along with the standard deviation ranging from 0.42 to 1.16 indicating that the items were the competencies possessed by teachers in knowledge of subject matter for the implementation of secondary school chemistry curriculum.

Research Question 3: What are the competencies possessed by teachers in classroom management for the implementation of secondary school chemistry curriculum in Nnewi South Local Government Area?

Table 3: Mean and standard deviation of the respondents' responses on the competencies possessed by teachers in classroom management for the implementation of secondary school chemistry curriculum in Nnewi South Local Government Area

S/N	ITEM	X	S.D	Remarks
1.	Ability to arrange the classroom properly	3.74	0.61	Agreed
2.	Communication of concepts in chemistry effectively	3.82	0.38	Agreed
3.	Ability to utilize appropriate set-induction/entry behavior skills	3.85	0.35	Agreed
4.	Ability to apply diplomacy in conveying sensitive information to students in chemistry	3.48	1.14	Agreed
5.	Ability to maintain friendly facial expression while teaching	3.60	1.00	Agreed
6.	Ability to effectively use the chalk/white board along with other instructional materials	3.71	0.66	Agreed
7.	Use appropriate methods/strategies to implement the instructions	3.74	0.71	Agreed
8.	Maintain good eye contact with students while presenting the subject matter	3.57	1.06	Agreed
9.	Maintain good classroom voice	3.60	0.91	Agreed
10.	Ability to apply good gestures like nodding of head, patting students back as a way of encouraging good answers by students	3.71	0.75	Agreed
11.	Assess students learning behavior	3.74	0.82	Agreed

The data in Table 3, present the responses of the competencies possessed by teachers in classroom management for the implementation of secondary school chemistry curriculum in Nnewi South Local Government Area. The data revealed that the mean responses of the respondents in all the 11 items ranged between 3.48 and 3.85 along with the standard deviation values ranging 0.38 and 1.14 indicating that the respondents' agree with all the items as the competencies possessed by teachers in classroom management for the implementation of secondary school chemistry curriculum in Nnewi South Local Government Area.

Discussion of Results

The discussion of findings was done based on the results of the data analysed to answer the research questions as follows. From the result of the research question 1 answered in Table 1, it was revealed that all the 10 items were the competencies possessed by teachers in instructional planning for the implementation of secondary school chemistry curriculum in Nnewi South Local Government Area. This finding is similar to the study of Ebiringa (2012) who found out that teacher competencies in instructional competencies is necessary for effective instructional delivery. The findings from research question 2 answered on Table 2 further revealed that the competencies possessed by teachers in knowledge of subject matter for the implementation of secondary school chemistry curriculum in Nnewi South Local Government Area were: Adequate knowledge of basic concepts of chemistry, Adequate knowledge of redox reaction, Adequate knowledge of organic chemistry among others. This finding is also similar with the findings of Okafor (2016) who reported that without adequate knowledge of subject matter by teachers no meaningful teaching can take place in the classroom. The finding from research question 3 answered on Table 3 showed that all the 11 items were the competencies possessed by teachers in classroom management for the implementation of secondary school chemistry curriculum in Nnewi South Local Government Area. This finding is relate with the study of (Okafor, 2016) who reported that found out that teachers knowledge of subject matter is not enough for good teaching, it must be accompanied adequate knowledge of classroom management.

Conclusion

It was concluded from the findings of the study that teacher possessed adequate knowledge of instructional planning, knowledge of subject matter and classroom which enhances the implementation of secondary school chemistry curriculum.

Recommendations

Based on the findings and conclusion, the study therefore recommended that:

1. Since effective implementation of secondary school chemistry curriculum depend partly on teachers competencies there is the need to strengthen the competencies of chemistry teachers in secondary school through in service teachers training and development.
2. Effort should be intensified by Anambra state government through the ministry of education to organized regular seminar and conferences to teachers to upgrade their knowledge and skills regularly for effective implementation of secondary school chemistry curriculum.
3. There is need for supervision of teachers instructional activities by the head teachers and educational ministries to ensure effective implementation of secondary school chemistry curriculum.

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